

Welcome to the **September 16, 2008** posting to the Education about the Environment Interchange listserv! Any questions, issues, suggestions, or postings should be directed to Allison Brody at: allison.brody@unlv.edu

NEWS/ANNOUNCEMENTS

- ❖ Desert National Wildlife Refuge – Corn Creek has reopened after the summer season. The visitor center hours are: Friday 10am-2pm, Saturday 8am-2pm, & Sunday 8am-2pm.
- ❖ Death Valley National Park is seeking applicants for both a Park Ranger - Education Specialist position (GS-11) and a Park Guide (GS-5). For more information or to apply, contact Terry Baldino, Chief of Interpretation & Education at 760-786-3279.
- ❖ Don't need a new phone book every six months? 'Sign-up and opt out' at (<http://www.yellowpagesgoesgreen.org/>)
- ❖ Artist and naturalist Sharon K. Schafer has developed a website (skschaferart.com) dedicated to her fine art and photography.
- ❖ Two National Park Service Interpretation/Park Ranger positions are open at the Santa Monica Mountains. For more information, go to www.usajobs.opm.gov or contact Felicia R. Nickelberry by phone (805-370-2320) or Felicia_nickelberry@nps.gov.
- ❖ The first annual Blue Grass Roots Round Up, which will highlight Outdoor Education in Nevada, will be held October 10 from 5-9pm at the Governor's Mansion in Carson City. The event will feature many well-known speakers, including First Lady Dawn Gibbons, raffles, silent auctions, music, and delicious food. For more information, go to nevadaoutdoorschool.org.

CALENDAR

Date	Organization	Event
September 18	Water Street Gallery	Opening of "Bottomlands: Artists in the Las Vegas Wash" 5-9pm. 155 South Water Street, Henderson, NV
September 20-24		Take a Child Outside Week
October 7 – November 9	Nevada State Certification in Environmental Education & Interpretation	Tuesday and Thursday evenings http://www.enviroedexchange.org/certification/index.htm
October 10	Sierra Nevada Journeys/Nevada Outdoor School	Blue Grass Roots Round Up, 5-9pm, Governor's Mansion, Carson City, NV
October 15-18	EE on the Prairie 2008 North American Association for Environmental Education	National Conference in Wichita, KS

October 19-22	EarthScope – NSF funded project	Reno, NV - Basin/range workshop for interpretive professionals. Check out this website for more information and registration materials: http://www.earthscope.org/workshops/basin_range
October 30- November 1	The Association of Outdoor Recreation and Education (AORE)	"A Climate for Change" Conference in San Diego, CA (http://www.aore.org/conference/default.aspx)
November 1 -2	Clark County Parks and Recreation – Winchester Cultural Center	8 th Annual Day of the Dead Festival "Life in Death." For more information, call Irma at 455-7029
November 6-9	Association for Experiential Education 36th Annual International Conference	Vancouver, WA (http://www.aee.org/conferences/annualIntlConf)
November 11-15	National Association for Interpretation	National Workshop, Portland, OR

RESOURCES

- ❖ Slideshow with photos and descriptions of environmental and economic impacts of using plastic bags: <http://www.poonorecord.com/apps/pbcs.dll/article?AID=/20080506/MULTIMEDIA02/80505016>
- ❖ The California Academy of Sciences will open its doors on September 27, 2008. The organization is a museum, planetarium, research facility, aquarium, and a model of sustainability located in San Francisco, California. For more information, go to calacademy.org.
- ❖ The Walt Disney Company (<http://corporate.disney.go.com/outreach/>) and Youth Service America (<http://www.ysa.org/>) are accepting applications for grants of up to \$500 to support support children (between the ages of 5 and 14) in planning and implementing service projects in their community. Teachers, older youth (15-25), and youth-serving organizations are also eligible to apply if they engage younger children in planning and implementing the project. Applicants are particularly encouraged to address environmental issues and seek to empower children as young citizens through their projects (<http://fconline.foundationcenter.org/pnd/15015101/ysaawards>).

FOR IMMEDIATE RELEASE: September 17, 2008

Global Warming's ecosystem double whammy
DRI study shows one abnormally warm year suppresses carbon dioxide uptake for two years

RENO – Plants and soils act like sponges for atmospheric carbon dioxide, but new research finds that one abnormally warm year can suppress the amount of carbon dioxide taken up by some grassland ecosystems for up to two years. The findings, which followed an unprecedented four-year study of sealed, 12-ton containerized grassland plots at DRI is the cover story in this week's issue (September 18) of the journal Nature.



"This is the first study to quantitatively track the response in carbon dioxide uptake and loss in entire ecosystems during anomalously warm years," said lead author Jay Arnone, research professor in the Division of Earth and Ecosystem sciences at DRI. "The 'lagged' responses that carry over for more than one year are a dramatic reminder of the fragility of ecosystems that are key players in global carbon sequestration."

The plants and soils in ecosystems help modulate the amount of carbon dioxide (CO₂) in the atmosphere. Plants need CO₂ to survive, and they absorb most CO₂ during spring and summer growing seasons, storing the carbon in their leaves, stems and roots. This stored carbon returns to the soil when plants die, and it is released back into the atmosphere when soil bacteria feed on the dead plants and release CO₂.

The four-year DRI study involved native Oklahoma tall grass prairie ecosystems that were sealed inside four, living-room-sized environment chambers. The dozen 12-ton, six-foot-deep plots were extracted intact from the University of Oklahoma's prairie research facility near Norman, Okla., in order to minimize the disturbance of plants and soil bacteria. Inside the DRI's sunlit-controlled EcoCELL chambers, scientists replicated the daily and seasonal changes in temperature, and rainfall that occur in the wild.

In the second year of the study, half of the plots were subjected to temperatures typical of a normal year, and the other half were subjected to abnormally warm temperatures -- on the order of those predicted to occur later this century by the Intergovernmental Panel on Climate Change. In the third year of the study, temperatures around the warmed plots were turned down again to match temperatures in the control plots. The CO₂ flux -- the amount of carbon dioxide moving between the atmosphere and biosphere -- was tracked in each chamber for all four years of the study.

DRI's EcoCELL facility gave the scientists an unprecedented degree of control over the enclosed ecosystems. Not only could they create the same air temperature conditions from year-to-year, they could also independently control the soil temperature in each chamber -- a key feature that enhanced the ecological relevance of the results. Each containerized ecosystem also sat on "load cells," the type of scales used to weigh trucks on highways. Scientists used the scales to track the amount of water that was taken up and lost by the plants and soil in both normal and abnormal years. Thus, each containerized ecosystem served as a weighing lysimeter, an instrument that's used to measure the water and nutrients that percolate through soils.

The scientists found that ecosystems exposed to an anomalously warm year had a net reduction in CO₂ uptake for at least two years. These ecosystems trapped and held about one-third the amount of carbon in those years than did the plots exposed to normal temperatures.

"Large reductions in net CO₂ uptake in the warm year were caused mainly by decreased plant productivity resulting from drought, while the lack of complete recovery the following year was caused by a lagged stimulation of CO₂ release by soil microorganisms in response to soil moisture conditions," explained co-author Paul Verburg, also from DRI.

Numerous studies have found that the Earth's atmospheric CO₂ levels have risen by about one-third since the dawn of the Industrial Age. CO₂ helps trap heat in the atmosphere, and political and economic leaders the world over are debating policy and economic reforms to reduce the billions of tons of CO₂ that burned fossil fuels are adding to the atmosphere each year.

"Our findings confirm that ecosystems respond to climate change in a much more complex way than one might expect based solely on traditional experiments and observations," said study co-author James Coleman, vice provost for research and professor of ecology and evolutionary

biology at Rice University. "Our results provide new information for those who are formulating science-based carbon policies."

The large collaborative study involved scientists from the DRI; University of Nevada, Reno; University of Oklahoma in Norman, Okla.; University of New Hampshire; the National Center for Atmospheric Research in Boulder, Colo., and Rice University in Houston, Texas. The study was funded by the U.S. National Science Foundation's Division of Environmental Biology under the program, "Integrated Research Challenges in Environmental Biology" (Grant Number: DEB0078325).

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